

this phenomenon the intestine loses the horizontal position with apertures directed downwards, which it at first possessed, and passes gradually through two other positions:—1, one vertical with apertures directed towards the posterior surface of the larva (which, as in the *Escharinæ*, becomes the anterior surface of the adult); the other horizontal and with apertures directed upwards.

The first position represents a state precisely analogous to *Loxosoma*, with the anus above and the œsophagus below; the second is that of *Pedicellina*.

III. While the digestive tube is undergoing this rotation, the vestibule divides into three distinct parts:—1, the inferior one, which bears the circling, and of which the elements come to form the gland of the foot, which is also visible at a certain epoch in the *Pedicellina*; 2, the superior one, which follows the digestive tube and becomes isolated to form the tentacular chamber; it is this portion that will give origin to the tentacles; it afterwards places itself in relation with the exterior by means of a cleft-like invagination of the ectoderm; 3, the median portion, which becomes degenerascent to give origin to the mass of globules, which at first fills the cavity of the peduncle, and each of which afterwards becomes converted into a stellate cell of the supposed colonial nervous system.

IV. There remain the two enigmatic organs of the ectoderm (organs of sense) which a recent author (Hatschek) represents as playing so important a part. These, in my opinion, are nothing but provisional organs; they are both thrown up upon the dorsal surface, where they finally disappear by degrees. No doubt we must recognize in the two setæ described by Salensky upon the dorsal surface of *Loxosoma crassicauda* the remains of the anterior organ of sense, which, according to my investigations, comes to occupy this position.—*Comptes Rendus*, June 27, 1881, p. 1527.

*On the Structure of the Oothecæ of the Mantides, and the Hatching and first Moults of the Larvæ.* By M. C. BRONGNIART.

Several groups of Articulata surround their eggs with a common protective envelope. Sometimes it is in the body of the female itself that this agglomeration is effected (*Blattina*); sometimes, on the contrary, the female constructs the protective shell and deposits her eggs in it (*Spiders*, *Hydrophili*, *Mantina*).

Several authors, such as Pagenstecher, Roesel, Prof. E. Perrier\*, and M. Henri de Saussure†, have studied the egg-cases or *oothecæ* constructed by the *Mantes*. In May last I brought from Algeria some oothecæ of *Mantes*; and I have thus been able to witness the emergence of the young larvæ.

The egg-cases of the *Mantes* are deposited upon branches of shrubs or upon stones. The structure differs but little in the diffe-

\* Ann. Sci. Nat. Zool. 5<sup>e</sup> sér. xiv. (1870).

† Mission Scientifique au Mexique, 1872.

rent species. Outside, the ootheca is of a greyish-brown colour. It is generally pyriform, with the smaller extremity upwards; it appears to be strongly furrowed transversely. If we make a section in the direction of these furrows, we observe that the eggs are contained in a circular median chamber. Each of the large exterior furrows corresponds to a story; and an ootheca contains some twenty stories.

This median chamber is surrounded by frothy envelopes without eggs, the arched layers of which correspond to the succession of stories of the central chamber. Each story of this chamber is divided into two cells by a thin antero-posterior partition, and communicates in front with the exterior by a sort of flattened neck, the edges of which, in the form of scales, are bent and laid one over the other; that is to say, they are imbricated.

The eggs in each cell are symmetrically arranged, in such fashion that the portion of the egg which will constitute the extremity of the abdomen is applied to the wall, whilst the heads are turned forward obliquely and are all brought close together. Consequently the larvæ, to get out, will only have to advance straight forward, without any turning. Each central cell contains a dozen of eggs; there are about twenty-four on each story, each contained in a sort of gummy alveolus; the cells at the two extremities of the case contain a smaller number. This egg-case, which is at first transparent and frothy, solidifies and becomes impermeable to such a degree that it may be immersed in water without wetting the eggs.

To construct its egg-case the insect employs its abdomen and elytra. Clinging to the branch of a shrub, the Mantis secretes a frothy, slightly transparent liquid, which it holds up by means of the extremity of its elytra. By this means it can construct the first stories of its egg-cases in the form of a spherical hood by means of the regular movements of its abdomen, which kneads the frothy substance and spreads it in successive layers with the assistance of the cerci. The eggs are expelled by the abdomen, together with a certain quantity of frothy liquid, which will form the alveolus. The ootheca gradually acquires a darker colour and becomes harder.

After the copulation, which generally takes place in September, the female builds her ootheca. The eggs hatch in May and June. Last month I witnessed the emergence of the larvæ from the oothecæ that I brought with me. Each larva, while still soft, advances towards the aperture of its cell in order to issue from it.

M. de Saussure explains the emergence of the larva in the following manner:—"The little larva has now to escape from the cell in which it is enclosed; and *as it is too weak to make use of its feet*, nature comes to its assistance by means of a peculiar artifice. The surface of its body is clothed with a chitinous substance, upon which are developed some spines directed backward. By giving its abdomen an undulatory movement, the spines serving as a support

against the walls of the cell, the larva travels towards the operculum in the same way that an ear of rye, by the aid of its spiny beards, can travel over a piece of cloth which is set in vibration." The comparison employed by M. de Saussure is quite correct; but the spines are not, properly speaking, upon the abdomen; they are situated on the cerci, which have the form of two large mamillæ. Moreover the legs are covered with strong spines, which likewise assist the young larvæ to travel in their alveolus. The larvæ of the upper part of the case are the first to issue, although these eggs were the last laid. Sometimes the lid of the cell closes again before the larva has completely issued and it perishes. Those which succeed in quitting the ootheca, instead of falling to the ground, are sustained in the air by the aid of two very long and very slender silky threads, fixed on the one hand to the extremity of each of the cerci, and on the other adherent to the inner and posterior wall of the shell of the egg. Very soon all the little larvæ thus suspended from the ootheca form a sort of bunch. They remain for some days in this state; and when the first moult has taken place, their cast skins remain suspended from the ootheca.

If these young larvæ were to fall to the ground in such a feeble state, they would become the prey of their enemies. After the moult they manifest their voracity by falling upon the small insects they meet with, and they are very active.

The silky threads which sustain these young larvæ have been regarded as the representatives of the cerci; but in the larvæ contained within the egg the cerci already exist, and are formed, as I have already indicated, by two short rods covered with spines.

It often happens that, in order to change the skin, the larvæ of these insects are obliged to attach themselves to the branches by means of filaments. These long silky threads seem to have no other purpose but to enable the larva to effect its first moult secure from all dangers.—*Comptes Rendus*, July 11, 1881, p. 94.

#### *Observations on Cladocoryne floccosa.*

By M. DUPLESSIS.

M. Duplessis's memoir on *Cladocoryne floccosa* (Bull. Soc. Vaud. des Sci. Nat. 2<sup>e</sup> sér. tome xvii. pp. 108–118) furnishes us with complete information upon a curious type of Hydroids which is the sole representative of a distinct family. The distribution of the tentacles, their dichotomous branching, and their knobbed terminations would seem to bring *Cladocoryne* into the family Cladonemidæ or into that of the Clavatellidæ. But in both these families the polypes produce Medusæ, while the genus *Cladocoryne* is larviparous. It approaches the family Corynidæ by the constitution of its genital capsules and by the arrangement and form of its tentacles; but it is the only larviparous genus in which the latter organs are branched. Unless we were to modify the diagnosis of the Corynidæ we must therefore form a family Cladocorynidæ, including the